



**62 Years of DX-cellence**

**August 2010**



# BULLetin

The Southern California DX Club Newsletter est. 1947

*"If you need him  
get in there and  
work him"*

The Southern California DX Club is a group of dedicated men and women active in the amateur radio community who enjoy communicating over the air with other radio amateurs around the world.

The newsletter is published every month and is released to its members about the first of each month. Amateur and DX related letters, news and pictures are welcome and will be published as time and space permit.

Articles may be republished with the recognition of the author and the club. Reuse of copyrighted materials require the original author's permission.

Any questions regarding this newsletter or its articles should be addressed to the editor, Bill  
[n6rv@scdxc.org](mailto:n6rv@scdxc.org)

Meetings are held on the second Thursday of the month at 7:30 PM except April, June and December.

Please check the club web site for events and details at  
<http://www.scdxc.org>

If you are in the area please say hello on our repeater  
**W6AM/R145.48,(-) 100Hz PL**



## NEXT MEETING

**August 12th @ 7:30 PM!**

**Dick Norton, N6AA**

**ARRL Southwestern Division Director  
July Board Meeting Results**

## • Don't Forget the Summer Bash!

**Wayne and Sharon's House  
August 22nd 12:00 PM - 5 PM**

## • Dennis, NS6C, Tops the Honor Roll!

## • Norm, NQ6L, Achieves DXCC!

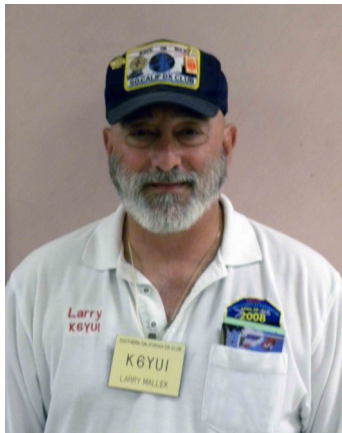
## • Six Meter DXing

**Seems someone got carried away with the subject!**

## • Visalia Holiday Inn

**Have you made your reservation for IDXC 2011?**

**Making friends all over the world using the magic of Amateur Radio.  
Sponsors of the International DX Convention, since 1949**



# THE PREZ SEZ

**Larry Mallek, K6YUI,**  
**President – Southern California DX**  
**Club**  
[k6yui@scdxc.org](mailto:k6yui@scdxc.org)

Hello to all!

First off I would like to thank all the members and our 2 new guests for another great turn out at the July meeting, I'm not sure if there were any open seats at all in the meeting room. Also thank you Bob-N6OX for another great presentation. Oh my! Did you see all of those \$100 bills.

Well here it is the end of July with the hot weather slowly coming down. Sure has been a hot one for me in Anaheim, weather that is, but not on the ham bands. I see a lot of thing on the telnet page and some of them I can work but most of them just are not copiable.

As always our VP John-N6QQ did it again with some really fine items for the drawing.

I had hoped to work some new grids last weekend on 6 meters but it seemed that there were not any openings at my QTH. The enclosed picture shows my antenna system with the 7 element 6 meter beam up at about 30 feet. Sure wish I could get it up at the top of the main tower at 80 feet.



Well I am looking forward to seeing all of you again at the meeting on August 12 and again remember that we have the Summer Bash coming up on August 22 at the home of Sharon-K6IRD and Wayne-W6IRD Spring in the city of Orange. All info is on the web page. This get together is always great.

So for now, remember **DX IS**

**Larry Mallek K6YUI    President SCDXC**

**Treasurer's Report**  
Club financial information is available on request. Contact the treasurer.

**Officer Guidelines**  
In 2000 Jim Zimmerman, N6KZ, and Chuck Constantine, KR6C generated a set of guidelines for club officers. Steve Shane, W6NRQ, headed up an effort to update these guidelines. The board reviewed and approved them. They are posted at the site to the left under the president's article

# VICE PRESIDENT'S CORNER

**John Schroeder, N6QQ,**  
**Vice President – Southern California DX Club**  
[n6qq@scdxc.org](mailto:n6qq@scdxc.org)



Hello Everyone!

It was a delight to listen to Bob, N6OX, on his operation from YI9PSE. Bob was able to give me entity 325. I will be sending him the list of the last 9 entities I need. Maybe he can help me finish them up! You know some of my last 9 places are much safer than Iraq! Thanks for both traveling there and the great presentation.

Next meeting, Dick Norton, N6AA, will report on the up-to-date happenings at the ARRL July Board meeting. You know rumor has it that the DXCC List is about to expand! What can you tell us about this Mr. Norton? Come to the meeting and find out.

Looking for some new stuff or band fillers ? In August look for S79DB - Seychelles, XU7ATM - Cambodia, A25 - Botswana and OJ0 from Market Reef. To Check out the latest DX expeditions try this web site:

<http://www.ng3k.com/misc/adxo.html>

As for the contests in August, please join me in the 10-10 Summer SSB Contest on Aug 7-8. Last year, I worked several stations in the San Diego area. Hope from better conditions. This month's stateside contests also include: NAQP QSO Party CW Aug. 7-8 and NAQP QSO Party SSB on Aug 21-22. The WAE DX CW Contest - Work All Europe Contest is on Aug 14-15. This contest everyone works Europeans only and Europe works the world. For the RTTY folks try the SARTG WW RTTY contest on Aug 21-22.

If you would like to check out a web site for the latest Contest information, try

<http://www.hornucopia.com/contestcal/contestcal.html>

See you at the August meeting, Don't forget the Summer Bash at the Wayne's QTH! It is going to be a gathering to remember!

**73, John N6QQ**

**Vice-President, SCDXC**

**DXer of The Year**  
**Congratulations Ernie**  
**N6HY!**  
**The Clipperton**  
**Award**  
**Congratulations Rich**  
**AE6RS!**

## July Prize Winners

<b>W6HTW</b>	<b>Nikon Camera</b>
<b>NQ6L</b>	<b>APC Battery Backup</b>
<b>NY6Y</b>	<b>LED Monitor</b>
<b>N6NQY</b>	<b>Ink-Jet Printer</b>
<b>N6QQ</b>	<b>Kill- A - Wattmeter</b>
<b>K5KT</b>	<b>Drill Bit Set</b>
<b>N6IC</b>	<b>Paper / Voltmeter</b>
<b>N6OX</b>	<b>Optical Mouse</b>
<b>K6OGO</b>	<b>Cord Organizer</b>
<b>K6LD</b>	<b>2007 Handbook</b>
<b>N6DHZ</b>	<b>Chicken Dry Rub</b>





# THE EDITOR

**Bill Kendrick, N6RV,**  
**Editor – Southern California DX Club**  
[n6rv@scdxc.org](mailto:n6rv@scdxc.org)

## New Members

I have to thank Keith, K6LD, for the great photo coverage of the meetings. We have a steady stream of visitors and new members every month. Welcome! We hope you find our unique club inviting and enjoyable. The group is exceptional and your membership will add to our quality!

**Please welcome new members:**

**Mark Willardson**  
**N6UOZ**

**Gabriel Calfas**  
**K6AWB**

**Diana Feinberg**  
**AI6DF**

**Linda Souder**  
**KD6HYN**

**Lloyd Hendrickson**  
**K6NQY**

**David Lopez**  
**KN6OP**  
**Now**  
**N6RI**

**Stan Thornton**  
**KI6QM**

**Randy Johnson**  
**W6SJ**

**Dale Piedfort**  
**KB7UB**

**Mary Gray**  
**KH7VZ**

**Make sure you meet and greet them at the next meeting!**

**Hello My Fellow DXers!**

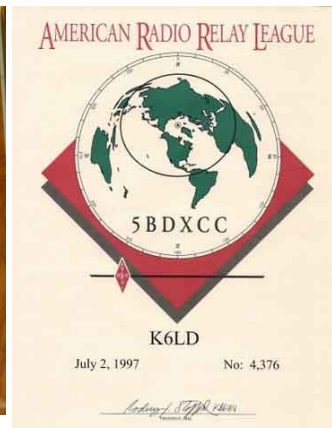
Usually summer is a low yield period for DX. For some reason this past week we have seen quite a few stations from exotic places. The DXpeditioners on Wallis Island have been heard everywhere. I am listening to a Togo station going strong as I type this column. Other stations on right now are XT2EME, 5N7M, several European and South American stations. At night the regular group of Middle Eastern stations congregate at 14.200 MHz. The band is alive! The numbers are increasing and this fall we may see some real life on 10 Meters! Finally!

Are you ready for four new countries? Well it seems that The Netherland Antilles is going to be granted independence and they will break up into four independent countries! Get ready because this October we will have four more DXCC entities! Many DXpeditioners are planning to sojourn to these beautiful spots and pass out new ones!

See all of you at the Summer Bash! We will miss the August meeting due to a short jaunt to Carmel. You know retirement does not always have to be ham radio, Jeopardy, and Wheel of Fortune! It is good to get out and explore!

**73, de N6RV**

**... ..**



**A few of the resident members finally submitted their 5BDXCC!**

**Old School**

*A plethora of announcements, rumors, and serious DX fun*

# DX ACCOMPLISHMENTS

*Celebrate the Successes of Our Fellow Members!*

## Updates

### Late Breaking News!

It has been reported that Norm, NQ6L, has submitted for DXCC with 101 entities checked by our own vice president, John, N6QQ. Way to go Norm!

Also George, N6VNI, and Dennis, NS6C, updated their standings this month. Both are hard charging up in the standings! As the sunspots begin to appear expect a lot of band mode opportunities! Do not let them slip by.

George has moved up to 195 and is on the verge of RTTY DXCC. Way to go George.

Dennis, NS6C, stands at the top of the honor roll with 355 when deleted countries are included! Welcome to the top! Many of us are following close behind! Thanks for the input Dennis.

Mark, K6FG, just worked FS/W6JKV on 6 meters as I am typing. He has updated his standings and his numbers look really good!

Thanks for all the updates! Keep those cards and letters coming in!

### SCDXC WAZ and DXCC Standings (N6RV)

The first of the two large numbers represent the number of confirmed zones on the 9 HF bands 160-10 (less 60 meters). The next column contain the following codes:

**M**     **Mixed**  
**P**     **Phone**  
**C**     **CW**  
**R**     **RTTY**  
**5**     **5 Band**

If you have any information to post please email me:

[N6RV@SCDXC.ORG](mailto:N6RV@SCDXC.ORG)

## WAZ STANDINGS

	9B / 5B	Awards
EU7SA	355 / 200	M/5
N6AW	355 / 200	M/P/C/5
WA5VGI	352 / 200	M/P/C/5
W6VX	352 / 199	
K6FG	345 / 196	M/P/C/R/5
W6SR	342 / 200	M/P/C//5
W8DX	339 / 200	M/5
K6YUI	337 / 200	M/P/C/R/5
W6YOO	303 / 200	M/P/C/5
K6YRA	280 / 200	P/5
KC6X	278 / 200	M/C/5
N6RV	268 / 183	M/P/C
K6LD	271 / 172	M/P
KR6C	264 / 166	M/C
KJ6Y	261 / 172	
WD6L	248 / 200	M/P/5
K6SY	246 / 173	P
K6GXO	227 / 193	M
N6OU	220 / 200	M/5
N6DHZ	214 / 160	P
KH6DX/m	210 / 184	
NS6C	/ 198	
K2PLF	191 / 191	
K6KII	191 / 177	M
W6IRD	181 / 147	M/P
W6NRQ	180 / 147	M/P
K6IRD	154 / 126	M/P
WA6BOB	152 / 136	M
K6IRA	118 / 102	
W3SE	102 / 112	
K6VC	96 / 96	P
W6EA	92 / 86	
N6VNI	86 / 64	
KA6TTV	82 / 67	
N6UC	78 / 78	M
N6GIL	49 / 43	
W6DCK	40 / 40	P
WB6PSY	40 / 40	P
K6JW	40 / 40	M/P
K6YR	39 / 39	
KT6LA	36 / 36	
NZ6L	36 / 36	
N6HE	36 / 34	
W4EF	29 /	
N6AWD		M
N6HC		M/P/C
KB6KTV		P
W6OES		M
K8RD		C
K6UNR	/ 200	M/P/5

## DXCC STANDINGS

	TOT / CUR
K6KII	382 / 338
JA1BK	377 / 338
K6YRA	372 / 338
N6UC	365 / 338
K6YUI	360 / 338
K6EXO	360 / 335
NS6C	355 / 338
N6AW	355 / 337
W6HT	354 / 338
W6SR	353 / 338
WA6WZO	352 / 338
K8RD	351 / 338
K5KT	350 / 338
K6FG	350 / 338
K6GXO	350 / 338
N6RV	349 / 336
K2PLF	349 / 338
N6RV	349 / 336
K6IPV	349 / 331
W8DX	348 / 337
W6OM	347 / 337
W6AUG	345 / 338
KC6X	344 / 337
W6OES	344 / 329
W6KK	343 / 338
W6VX	343 / 338
N6AWD	343 / 336
K6LD	343 / 338
W6DCK	342 / 336
WB6PSY	342 / 333
EU7SA	340 / 336
KB6KTV	340 / 335
W6YOO	340 / 334
WA5VGI	342 / 336
KR6C	337 / 335
N6OU	334 / 329
N6HC	333 / 338
W6IRD	327 / 324
K6UNR	333 / 332
W6QE	332 / 324
KJ6Y	327 / 323
K6SY	312 / 310
AD6KQ	299 / 299
WD6L	295 / 292
W6HB	291 / 285
N6DHZ	286 / 284
W6NRQ	284 / 284
N7CQQ	268 / 266
K6JW	253 / 251
K6YR	244 / 244
K6GEP	239 / 226
K6DJ	236 / 236
K6HCJ	235 / 235
K6IRD	229 / 229
K6GEP	229 / 226
K6VC	227 / 227
WA6BOB	202 / 198
N6VNI	195 / 195
KT6LA	161 / 161
KA6TTV	145 / 145
N6HE	145 / 140
K6OGO	142 / 142
W6EA	138 / 138
W6VWV	134 / 134
W4EF	132 / 132
K6LX	125 / 125
WA6NOL	112 / 111
NZ6L	27 / 27

# SPURIOUS OUTPUTS

## *Comments, Announcements, and Interesting Tid-Bits Submitted by Members*

### **Win - EQF Announcement (ZL3TE)**

#### ANNOUNCEMENT REGARDING THE WIN-EQF LOGGING PROGRAM

Win-EQF WILL LIVE ON AS Win-EQF\* Win-EQF\* is based on Win-EQF v. 1.94S by Tom Dandrea, N3EQF, who decided to bring development of Win-EQF to a halt after serving thousands of users since first publishing Log-EQF for MS-DOS in 1989. However, instead of letting Win-EQF go QRT - Tom decided to look for another programmer to maintain and develop future versions of Win-EQF. After a brief period of discussions - Win-EQF moved across the Atlantic Ocean and is now maintained by Torkel M. Jodalen, LA6VJA, residing in the cute little kingdom of Norway. Win-EQF\* is the "new" product name, with the asterisk added to distinguish between the former N3EQF product and the current LA6VJA product. The plan is to keep Win-EQF\* alive and continue maintenance, bug fixing and product development. Win-EQF\* will, however, remain true to its roots - there will be no popping windows, no bells and whistles - just pure performance QSO logging with well-considered functionality.

#### SALES AND DISTRIBUTION

John, K1XN, will continue to head up Sales and Distribution for the new Win-EQF\* project. John will also try and assist with the minor issues users may have just as in the past. Distribution of Win-EQF\* will be by download only from the Win-EQF\* download page at <http://www.golist.net>. As in the past new orders, upgrades and replacements will be available from John, K1XN.

#### Win-EQF\* ONLINE FORUM AND WEBSITE

A new Win-EQF\* forum is being set up on Google Groups and when completed an announcement will be made on Tom's (N3EQF) FORUM giving the URL of the new location. Users helping users is still the most important part of product development and issue solving. The new online home of Win-EQF\* is located at <http://www.bitwrap.no/eqf>. The forum is limited to members only, but membership is free and can be applied for on-line (members-only forum chosen in order to limit the risk of being spammed by automatic mailers, etc).

#### PRICING

Pricing will remain the same as with the old Win-EQF program.

#### CUSTOMER SERVICE

Both John and I will strive to continue the customer service for Win-EQF\* that you are accustomed to. John will be able to answer emails much faster than I, as I still have a day job and I am out of the country on flights routinely.

#### USER INPUT

You the user will play an important role in the development of the new Win-EQF\* versions. Your ideas and suggestions are important to us and we will work on making Win-EQF\* even more useful to your logging needs. We must always keep Win-EQF\* a simple and easy to use piece of software. Please join with us to keep and improve a great logging program alive and flourishing.

#### SHORT-TIME PLANS

Short-time plans include the release of Win-EQF\* v. 2 by mid-September, 2010. A few new features are planned. Stay tuned to the website at <http://www.bitwrap.no/eqf> for details!

73 es cu in the log

Torkel, LA6VJA la6vja(at)gmail.com



# SIX METER DXing

Six Meters is one of the most enigmatic ham bands. It is at the boundary of the HF and VHF bands and exhibits the behavior of both.

## Propagation Modes

Several propagation modes occur on the magic band. To name a few there is sporadic E (Es), Transequitorial Propagation (TEP), Backscatter and Side Scatter, Meteor Scatter and of course F layer propagation. Many of these modes occur on 10 meters and some on other VHF bands but not with the frequency or distance encountered on six. Sometimes they link to each other. There could be a double hop Es opening from the West Coast to the East Coast that catches an F2 opening into Europe or an equatorial scatter opening that links to an Es opening to Africa. There is also the electron bulge around the magnetic equator that serves as a waveguide of sorts trapping signals that enter into it and exiting in some of the most non-intuitive places. Unfortunately the magnetic equator dips below the Earth's equator at our latitude and we do not enjoy that propagation. The magnetic equator does rise above the physical equator over the Atlantic and into the Mediterranean giving Florida, North Africa, and Western Europe some very unique propagation. There are many discussions regarding six meter propagation. In particular there is K6MIO's treatment that can be found at <http://www.ham-radio.com/n6ca/50MHz/50ops.html>.

Every year previously unknown openings have been discovered even at the bottom of the sunspot cycle. With this year's low Es activity some operators still worked all continents on multi-hop sporadic E with modest stations. The reason for the increase in these discoveries is largely due to new equipment, serious operators with big stations dedicating a good deal of time on the band, and the delayed solar cycle upswing. Major manufacturers have included six meters in just about every new radio. Because there is nothing on HF in the summer operators are migrating up to six meters. For some it is like starting over. It is just as exciting to work an East Coast station on a short double hop opening as it is working the Indian Ocean on HF.

The best openings in my opinion are the long haul F2 openings. At the peak of the cycle both Long Path and short path openings can occur. The duration can be from days to minutes. Usually the opening is sudden. It may start with a whisper of a signal and then, like a light turning on, the band takes off. Likewise it often suddenly disappears.

## DX

There is a real possibility of working DX on this band. The ARRL DXCC stats prove this out. The top DXCC standing for Six Meters is 234 countries. Not bad considering Europe was given access on this band a cycle or so ago. Russia, much of Asia and some of the Pacific do not permit six meter operation except experimental licenses during the Es season. The number of entities available on 6 is much less than the current count.

A distinct advantage on 6 is the ease at which DXpedition can augment their equipment to accommodate operation on this band. All you need is a little height above ground at a high point like a cliff or hillside and, voila, instant DX! There are many six meter only DXpeditions. W6JKV, Jimmy, almost every year selects a country to activate. This year FS/W6JKV found its way into many logs during the Es season.

## The Stations

It is relatively inexpensive to put a fair size station on the air. Consider a modest HF station, a small 16 foot boom tribander a 50 foot tower. At 14.2 MHz this translates into a 0.23 wavelength boom at 0.72 wavelengths above the ground. A similar antenna for 50.110 MHz would be a 4.5 foot boom antenna 14.2 feet off the ground. Of course many hams place larger yagis on top of their existing tower. Take for instance the M<sup>2</sup> 6M5X, 5 element yagi, at 80 feet. This 18 foot boom antenna is light and can be lifted with one hand. Placing it 10 to 12 feet above an HF yagi on a 70 foot crank up tower is easily accomplished. The 20 meter equivalent is a 5 element yagi on a 70.6 foot boom at 282.3 feet. Not many hams have this sort of 20 meter system!



Some dedicated operators (N6CA & K7JA) have 40+ foot boom yagis at 70 plus feet. The 20 Meter equivalent is 141 foot boom yagi! The weight and bulk of these antennas are on the order of a large tribander.

An even rarer breed of 6 Meter DXer (K6QXY) has stacks of 60 foot boom yagis on a rotating 120 - 200 foot tower. The equivalent on 20 Meters is a 212 foot boom yagi at 424 - 705 feet! The gain of a system like this is beyond comparison.

**Signal Strength**

Looking at received signal strength given the relatively huge antennas produces some interesting findings. The free space gain of various antennas is listed below. Note that the vertical antenna is included and is not free space. It incorporates the ground losses not seen with yagis at a wavelength or higher above the ground. Ground gain for horizontal yagis can increase the effective gain as much as 6 dB. This is a benefit that vertically polarized antennas do not possess.

Antenna	Elements	Boom (ft)	Gain (dBi)
M2 6M11JKV	11	69.00	16.14
N6CA 8	8	41.00	14.10
M2 6M7JHV	7	30.67	13.01
M2 6M5X	5	18.00	11.54
M2 6M3	3	6.75	8.51
Equivalent Tribander	3	4.53	6.55
Vertical	1	0.00	-2.73

The variation in yagi antenna gain alone is almost 8 db and over 24 db compared to a vertical if ground gain is considered. It becomes readily obvious that based on antenna gain alone the larger systems will hear stations that the smaller ones can not detect.

Next consider the height. A good rule of thumb is signal strength increases 3 dB each time the height on one side of the circuit is doubled (Fresnel). Since we are dealing with a shorter wavelength it is easy to place an antenna on a portable 15 foot mast and take off to a hillside to operate. Again the 20 Meter equivalent for a mast that size on the side of a 1500 foot hill is a yagi at 50 feet above ground on a 5300 foot mountain and at 5000 feet on 6, there is no comparison in breathable atmosphere! Furthermore mountain topping at HF is prohibitive unless you live there. There are not many easily transportable 50 foot tower trailers and setting one up on the fly will draw the ire of residents who live nearby.

The Fresnel assumption above is true only for relatively low heights. What comes into play as the antenna is elevated is the antenna pattern elevation angle. Below are plots of a 6M5X at various heights. I included 220 feet to demonstrate what even being a little ways up a hill will yield.

From the elevation plots two things become very obvious. First, as the antenna is raised the elevation angle drops. Second, the elevation beamwidth appears to narrow. There is an introduction of several additional lobes that are periodic over elevation angle. A by-product of the simulation is what seems to be a variation in gain. It is actually due to the simulation angle step size limited by the software application. As the main lobe narrows, and the elevation angle drops the peak falls between the increments in the simulation. In any event the apparent gain difference over the heights we are considering is only be a few tenths of a dB and can be considered negligible for this discussion.

So what conclusions can be drawn from these plots? First is that for various heights there are elevation angles that exhibit gain and other angles that do not. In fact there are “holes” in the patterns. If a signal arrives at one of those elevation angles then nothing is heard! Second, these holes are at different angles for various heights. Often one height’s gain is another ones loss (pun intended). Third, for the lower antennas there

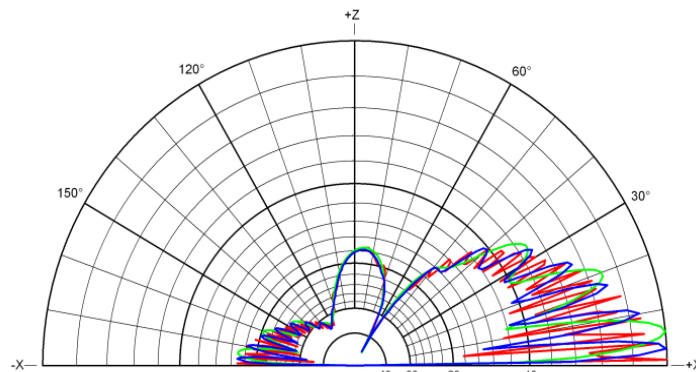
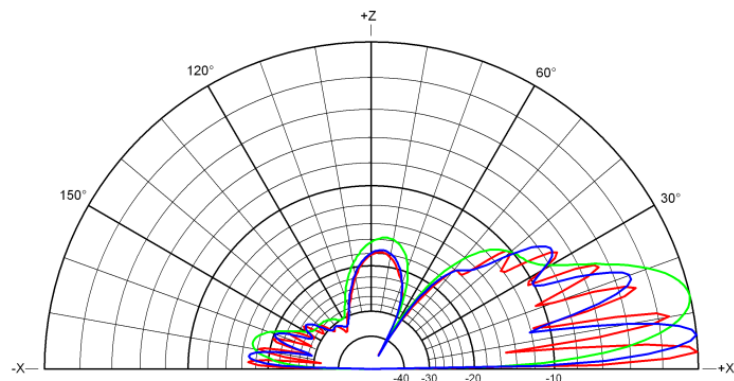
is a severe drop off in gain at angles below the main lobe. This drop off is ground loss and dielectric dependent and could be much worse given the soil in the Los Angeles area. Fourth, the elevation angle of the higher antenna is almost at zero degrees! All these effects can be mitigated by using switching between several vertically stacked yagis at varying heights. This method is commonplace on HF.

6M5X 80 ft  
6M5X 15 ft  
6M5X 40 ft

Over Real Ground (0.995, 1.1)  
Over Real Ground (0.995, 1.1)  
Over Real Ground (0.995, 1.1)

6M5X 220 ft  
6M5X 40 ft  
6M5X 80 ft

Over Real Ground (0.995, 1.1)  
Over Real Ground (0.995, 1.1)  
Over Real Ground (0.995, 1.1)



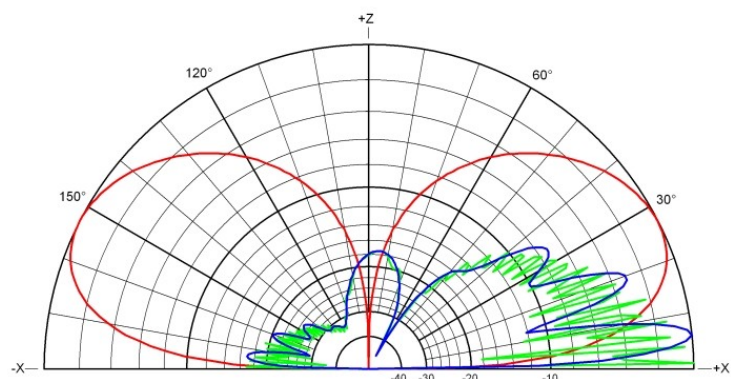
Max. Gain = 16.57 dBi  
Max. Gain = 14.31 dBi  
Max. Gain = 16.03 dBi

Vertical  
6M5X 220 ft  
6M5X 40 ft

Elevation  
50.110 MHz  
Elevation  
50.110 MHz  
Elevation  
50.110 MHz  
Over Real Ground (0.995, 1.05)  
Over Real Ground (0.995, 1.1)  
Over Real Ground (0.995, 1.1)

Max. Gain = 16.65 dBi  
Max. Gain = 16.03 dBi  
Max. Gain = 16.57 dBi

Elevation  
50.110 MHz  
Elevation  
50.110 MHz  
Elevation  
50.110 MHz

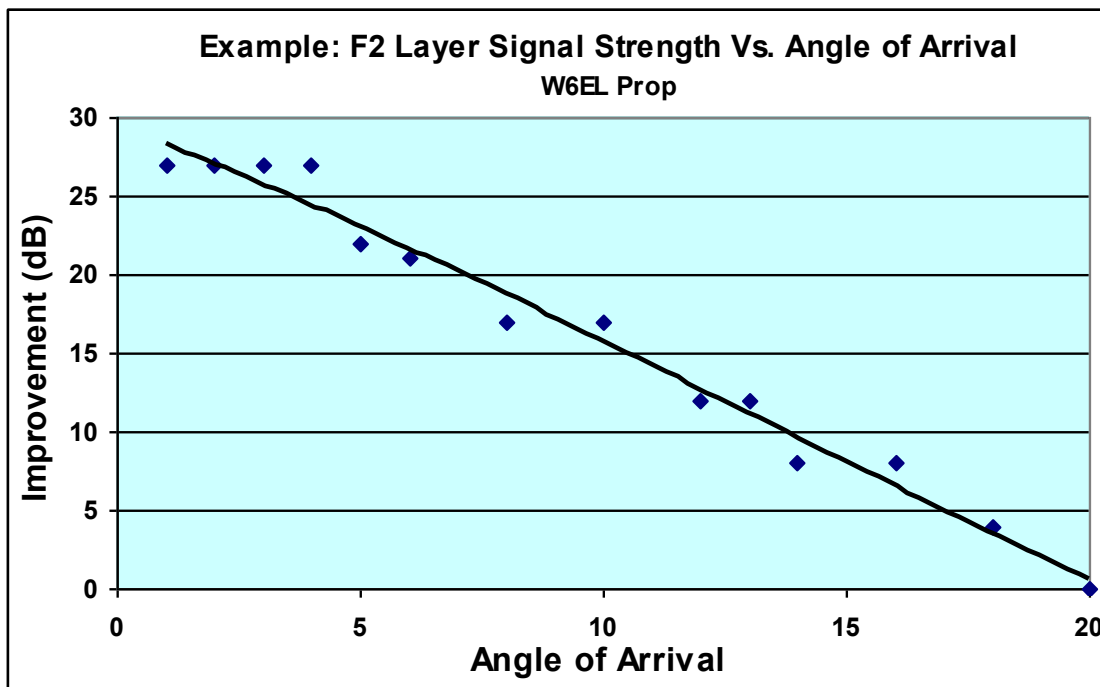


Max. Gain = -2.73 dBi  
Max. Gain = 16.65 dBi  
Max. Gain = 16.03 dBi

Elevation  
50.110 MHz  
Elevation  
50.110 MHz  
Elevation  
50.110 MHz

So what does this all mean? First, it has been said and observed that for the most part long haul F2 and multi-hop Es propagation the lower the elevation angle the stronger the signal. This is also apparent in HF. Below is a plot of signal strength difference versus elevation angle produced using Sheldon Shalton's propagation program W6ELProp. As the elevation cut off angle was lowered the received signal strength increased significantly. Furthermore from the HF simulation the opening durations were longer and some openings are not present at the higher elevation angles. It has been said that these effects are more pronounced on six meters. Many of the high angle openings that occur on HF do not occur on six meters until the Solar Flux Index is well above 200, particularly long haul DX. Again this is observable on HF. As the Solar Flux Index increases the maximum useable frequency increases. This is an extension of that phenomenon except it seems six meters is on the cusp. It is the highest ham band with F2 propagation. Commercial stations below the six meter band can serve as beacons. The opening literally moves up in frequency. Many six meter DXers will listen for these leading indicators. Often the opening does not make it up to six. There are several lists of these beacons on the web. A good website to visit and join is the UK Six Meter Group (UKSMG) <http://www.uksmg.org/news.php>

Second, even if there is no truth to the lower angle theory there are places where an antenna at one height has gain and the others do not. This would tend to make the openings occur at different times if the received signal elevation angle of arrival varies over the opening.



This can not be emphasized enough one person listening to the band hears nothing and another hears a lot. This is exacerbated by what is called the spotlight effect. Openings seem to be localized. Even stations a quarter mile apart can have extremely different openings. One may hear a station and not a whisper at the other. This effect seems to move around. Some times from one direction across a region, other times randomly. For hams in the basin it is almost deterministic. We miss a lot of openings that people to the North, South, and East get.

Third, because the elevation lobe is near zero degrees the higher antennas have a tendency to look right at local stations instead of shooting off above them. This does not affect gain but does explain in part why all the locals seem to be so loud, particularly those who are several hundred feet above you on a hillside.

It is obvious that the variation from station to station due to gain and an antenna elevation can easily be more than 50 dB! One station will be hearing someone S9+20 and the other not a whisper.

Finally there is another affect that drives the six meter operator to portable operation. We have seen how hills and mountains can be a blessing. They also can be a curse. If you live on one then you are blessed. If you are pointing into one you are cursed. Because of the low arrival angles of long haul DX stations any obstruction reduces the signal strength significantly. Though never quantified it has been observed that attenuation on the order of 30 dB between my QTH and New Zealand where Palos Verdes Hill blocks my field of view below 3.5 degrees. I believe the attenuation would be greater if it were not for scattering and fringing. Both bend the signal around the object at great cost in signal strength. So the ham operating portable from his car with a 3 element yagi at the end of Crenshaw near Del Cerro Park rules to the Pacific! Also the guys out in the high desert work all kinds of European delights that we in the basin never hear! Fortunately the advantage of being on the coast comes into play for working stations in other locales including some rare long path openings!

### **Signal to Noise**

The discussions above addressed only signal strength issues. As everyone knows the quality of reception is not just signal strength. It is the ratio of signal to noise. We can not ignore noise. Noise sources can be separated into three contributors: thermal, galactic, and man made.

Thermal noise is the limiting case when the two other contributors are not present. Basically any body that is above 0 Kelvin is radiating noise that is proportional to its temperature. If you are looking at a hot object it is

generating more noise than a cool one. Looking into the horizon the effective temperature is the ambient temperature of the atmosphere averaged with the surrounding ground temperatures. For the sake of argument let's call it 70 F give or take.

Typically thermal noise is not a problem because it is far weaker than the other two sources. It may seem spacey but for those who have looked at satellite communications links galactic noise is a prime contributor. The Milky Way basically lies along our equator (to be more exact along the solar plane). The theory is that the galaxy spun out like a big pinwheel and is somewhat flat. All those billions and billions of stars and gas produce noise which at 50 MHz is equivalent to a thermal source at 50,000 K. Since a typical day is around 70 F or 294 K the thermal noise from sources in the immediate vicinity is less than one percent, that is, more than a 20 dB below galactic noise. Since we lie in the plane of the galaxy, and assuming it is flat, the galactic noise is basically radiating from a southern direction for stations in the Northern Hemisphere. Possibly northern paths may not suffer as much. Of course, this assumes that the galaxy is infinitesimally thin. It is not nor is it uniform. Galactic noise is dependent on the portion of the sky the antenna is pointing at as well as variations in intensity over time. There may be periods where it is quieter and the other two noise contributors may predominate.

One benefit of the galactic noise contributor is that the noise contribution of a typical receiver is insignificant. The noise coming into your system from the antenna is much greater than any noise generated in the front end of your receiver. It should be greater but many manufacturers have achieved the almost unachievable producing receivers that are as deaf as stones. Often a Low Noise Amplifier is required to reduce the receiver noise contribution. Again this does not have to be a super low noise device as the antenna noise is often huge.

So thermal and galactic noise are often overcome by man made noise. If you are lucky and live in the boonies then you are not fighting the monster that looms in the urban areas. For my neighborhood manmade noise has its usual buzzes and blips however even when I am not pointed at that leaky power pole along Western Avenue with all the cars zipping down the block there is this other layer of noise that is ever present. It is almost random noise. In fact I mistook it for that except for one thing. I never really understood the necessity of a noise blanker. On HF an occasional car or pole would radiate some obnoxious interference. On six meters in the absence of the usual zips and zaps when I switch in the noise blanker the noise floor drops as much as 6 dB. That says if the blanker is working perfectly then the ambient man made noise is three times greater than all the other contributors. Well the blanker is not perfect so the ambient man made noise is probably the principle contributor! Again this is not the occasional car or power pole. This is the sum of all the little squeakers. My receiver has a noise reduction feature in it. It too does wonders for pulling out the weak ones, much more than on HF. You know those three element yagis and verticals? Well they are looking at a wider azimuth angle and capture a lot more manmade noise than the larger antennas. Furthermore many manufacturers design antennas to produce not only high gain but what is called a clean pattern. For us three element junkies this means a low front to back ratio. Not so for the large yagi designs. The parameters are set to produce low lobes in every direction except forward. So when you are wondering why K7JA is working the JA station and all you hear is noise it is because his antenna noise is lower. He is focused and only the sources in his forward lobe are heard. If you make an assumption that the noise sources are distributed uniformly over all azimuth angles then when the azimuth angle is cut in half noise drops 3 dB! This is not true for thermal noise and for galactic noise the effect is similar to thermal noise until the beam-width is very narrow.

Below is a table that summarizes an estimate in the differences in signal to noise between stations and various paths. What was not included in the discussion is atmospheric absorption versus angle of arrival. It is included in the signal strength versus angle of arrival plot made from W6EL Prop. Also note that either the elevation pattern gain degradation or the angle of arrival signal strength degradation was considered not both. The least deleterious effect was used for each case (-20 for the vertical & -6 for 3 element yagi). Note the estimate assumes the opening is low angle and the obstructions are the same for all stations.



It is obvious that for low angle long haul DX a vertical is severely disadvantaged as is the 3 element yagi at 40 feet. The majority of the degradation is due to the wider beamwidth. Also note that if these were line of site stations each would still be very loud. This leads into the next subject.

Contributor	Vertical Ground Mounted	3 El Yagi Valley Floor @ 40 ft.	8 El Yagi Hillside @ 80 ft.
Antenna Gain	-16.1	-5.6	0
Elevation Pattern Gain	-20	-10	0
Angle of Arrival	-25	-6	0
Man Made Noise	-20	-14	0
<b>Total</b>	<b>-61.1</b>	<b>-29.6</b>	<b>0</b>

### Dynamic Range

One of the first things a newcomer to six meters notices is that there can be a huge number of local stations that are very loud. Just like other VHF bands line of sight propagation is prevalent. We discussed earlier that the antenna elevation angle is much lower at 50 MHz and up. Antennas also typically are clear from local obstructions. As the pattern elevation angle lowers the gain just above zero degrees elevation increases. This in turn produces more power radiating directly at line of site stations. Not only are the signals loud, undesired distortion products from the local station that normally are below the noise floor are evident across the band. On big F2 openings you will observe some stations that generate a lot of trash. Often they are not locals. Fortunately most distortion products fall off rapidly as you move away from the transmit frequency. Most of the time long haul stations are just above the noise. It is not uncommon to be pulling a station out of the noise in the presences of a station that is S9 + 50 dB. Many times loud local station does not realize the DX is even there and if the distortion products at 50 dB down are S9.

Finally, for most receivers, the presence of many loud stations can exceed its dynamic range. Most receiver specifications consider only two signals present. A band fully loaded with loud signals is something few assess. A good receiver with a high intercept point front end and a narrow roofing filter in the first IF bandwidth to reject close in stations will minimize overload. The new transceivers with the wide spectrum displays missed the mark here. Furthermore custom built front ends can vastly improve performance in a strong signal environment.

### Band Plan

It would be very beneficial if local stations that are not chasing DX move as far away from the DX portion of the band. Six Meters is a couple MHz wide! Unfortunately the band plan places the DX window in between the domestic phone and CW bands. The domestic phone calling frequency is right at the top end of the DX window. This presents many problems for long haul DXing.

Band	Lower Band Edge (MHZ)	Upper Band Edge (MHZ)
<b>CW Band</b>	50.000	50.100
Beacon Sub band	50.060	50.080
Domestic & DX CW	50.080	50.100
<b>Phone &amp; CW Band</b>	50.100	50.300
<b>DX Window</b>	<b>50.100</b>	<b>50.125</b>
<b>DX Calling Frequency</b>	<b>50.110</b>	
Domestic Phone & CW	50.125	50.300
Domestic Calling Frequency	50.125	

Typically when there is a six meters DX opening there is a coincident domestic opening and again no one hears the same stations. You can understand how things could become very tense. For instance, a Pacific opening is a rarity for East Coast stations likewise European openings are rare for West Coast. Sometimes they occur simultaneously. Each coast is pointing almost at each other and neither hears the DX the other is chasing. Add to that the local stations that do not hear anything but locals and often are belligerent and you have a recipe for disaster. Usually this is resolved by DX stations moving away from each other and one region deferring to the other. This is not how things normally happen on HF.

### **Operating Etiquette**

Given the issues discussed above the operating methods on six meters incorporates some of the HF techniques and some that are specific to Six Meters alone. Here a list of guidelines that has proven to be beneficial. Some on this list are common sense nevertheless the behavior described below can be witnessed almost daily and the cost of not engaging in good operating practices on six is more pronounced than on HF.

#### **1. Listen**

There is an art to chasing DX on 6 meters. Stations are much weaker and, though it seems like you are listening only to noise, you will quickly realize that not only can you copy the weak ones they hear much better and respond to a call! DXpeditioners experience this all the time. Typically there are not many manmade noise sources in the rare spots or the group can pick a location that avoids them.

#### **2. Avoid calling CQ.**

It usually trashes someone else in a region that hears DX you do not hear. Absolutely do not loiter on the calling frequencies calling CQ. They are the most densely populated frequencies on the band. Wait for the DX to call there. The DX is usually isolated and does not interfere with other locals in their region.

#### **3. Do not chat on or near frequencies where DX is spotted.**

Just because you do not hear anything does not mean others are not. Usually openings are marginal and someone is struggling to pull him out. Again this is way more prevalent on six meters than HF.

#### **4. Use one of the 6 Meter web pages.**

One of the greatest assets on six meters is the camaraderie. It is a worldwide phenomenon. One way to take the load off the band is to converse on one of the web pages. You can coordinate contacts, observe propagation moving across a region and announce contacts. The ON4KST web-page <http://www.on4kst.org> has been extremely useful. So much so that someone on the band not using it sticks out like a sore thumb. There is a local repeater on 445.500 MHz that also is used for coordination. The problem with repeaters is that you have to listen to them. When things get hot and heavy most hams are too preoccupied to answer questions like "What is going on?" Finally, the 50 MHz Logger <http://dxworld.com/50prop.html>, DX Summit <http://www.dxsummit.fi>, and DX Sherlock <http://www.vhfdx.net/> provide spots and maps that aid in the hunt.

#### **5. Work only DX stations you need.**

DXing sometimes brings out our competitive nature. Often there is a lot of bravado flying around. To give everyone equal opportunity do not work the same station on every opening or repeatedly unless no one is calling (verified by the DX station not working anyone). The propagation is so transient that you might deprive someone else of a new one. Jumping in the pile up is not common for the most part on the magic band. Even when a rare one shows up the pile ups are timed and usually well behaved. This probably will change as the population increases. Again with the large variation in station capability the pile up is layered and often the lower strata do not make it. Other times the opening is so extreme that you can almost work the station with the radio off! The Juan Fernandez DXpedition in 2001 comes to mind. <http://www.ham-radio.com/3q0z/>. N6CA, N6XQ

and company had three openings to the West Coast and several to Europe. Mobile stations and hams with fixed antennas pointed to the East Coast worked them. It was also said they worked every ham on Malta! While you are on the ham-radio.com website read the story: "The Mother of All Six Meter Openings" <http://www.ham-radio.com/n6ca/50MHz/mother.html> Chip describes a once in lifetime opening that netted many new countries for West Coast Ops.

#### **6. Call only stations you hear.**

It takes timing and skill to snag a station as quickly as possible. Do not sit calling a station just because he is reported by a local. If you can not hear him you will not work him. Listen. The opening often comes in waves. Time the contact. Again what you barely hear others may hear perfectly. More than likely you are interfering with someone else and you will not work the DX because you will not hear his transmissions. It is fun to listen all the operators calling out of sync with the DX. It is not funny if you are trying to work the same station.

#### **7. Minimize exchanges.**

Your call sign and a signal report is really all that is necessary. Even the grid square is unnecessary. It will be on the QSL card, it is typically included in the DX announcement on the website, or the station can look it up. Shortening the exchange means more people can work the DX. Remember the openings are short.

#### **8. Avoid rag chewing during DX openings.**

Far too many times someone starts a QSO right on top a rare station. Often uninitiated stations throws out a "QRZ?" after they hear someone work a DX station. They just do not hear them. The only way to know that the band is open is to listen and watch the web pages.

Many openings cover the majority of the phone sub band. During the only known opening to South East Asia from the West Coast a Vietnamese station was operating at 50.195 MHz. One time several European stations were convinced to move above 50.200 so they would not be covered up by the domestic stations. It worked and quite a few West Coasters made their first European contact.

If you have to chat take it to a web page, repeater or way up the band. 50.290 MHz and up would be a good suggestion.

### **Conclusion**

Six meters is a great band and there are several interesting modes and activities. Six meters exhibits many characteristics similar to the HF bands and VHF bands. Because it is the highest frequency allocated to amateur radio that supports long haul terrestrial DX many characteristics are unique only to it. There is greater variation in station capability. Signal variation is much greater. There are many more signals stronger than those encountered on HF and the DX is often much weaker almost barely copiable. Openings are often erratic and short lived. The DX operators who have dedicated a large amount of effort to this band have worked in cooperation with each other. On the other hand many operators have missed the opportunity to work DX and have made it difficult for others to do so even with a DX window. Operating skill and observing good practices will minimize these difficulties.

I hope this article explained some of the idiosyncrasies of the magic band and serves as an introduction to some beneficial operating practices. If anyone has more to add to this article I would be happy to compile updates and post them in future newsletters. Possibly as the cycle progresses it would be nice to report what is happening on 15 through 6 meters every month.



# July Meeting

The turn out for the July meeting was huge. Like every meeting this year it was standing room only. This speaks very well to the quality programs that our vice president has scared up. Maybe the unique prizes he brings has something to do with it and how about those snacks! John's simple concept is "I buy the prizes I would like to win." John's joy for making the meetings fun is infectious! Also it doesn't hurt that we get to see the first presentation on one of the biggest DXpeditions of the year by one of our resident DXpeditioners and good guy Bob, N6OX. Just like John, Bob's love for the hobby and adventure is infectious! Thanks both of you for making this a memorable meeting. You have added greatly to the hobby!



**Standing Room Only!**



**Bob, N6OX  
Sets Up**



**Larry, K6YUI  
Starts Us Off**



**Did You Meet Our Visitors?**



**Bill, N6MXU  
Lights! Action!  
Cameras!**



**Oh the Snacks!  
Soooo Good!  
Thanks Sharon!**



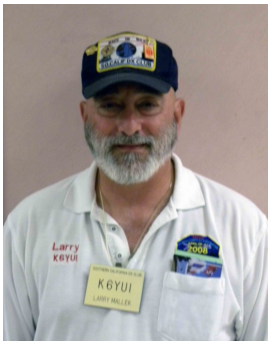
**The Best Presentation This Year!  
The Best Part:  
"Tell Your Wife Kurdistan and you can go!  
Then your son gives her a geography lesson!"**

**Great Prizes  
Again John!**

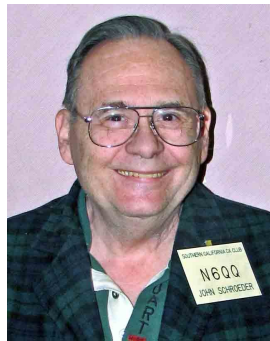




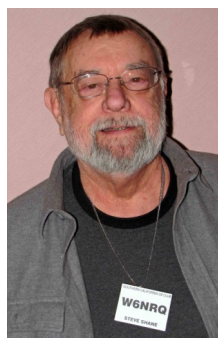
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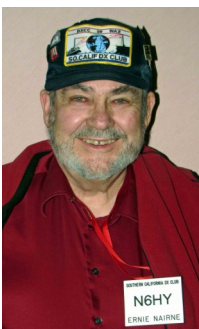
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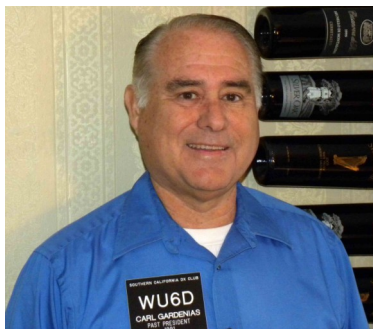
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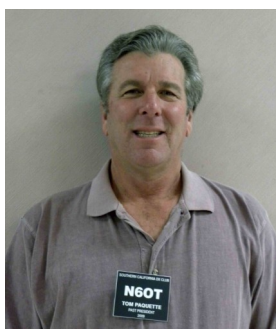
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